

et al. Applicant respectfully requests reconsideration by the Examiner in view of the following remarks.

Claims 1-14 of the present application are directed to a method of manufacturing a field emission device comprising operating the field emission device for a selected period of time at a pressure of at most about 10^{-8} Torr to evacuate outgassed materials, and sealing the field emission device. Claims 15-27 of the present application are directed to a field emission device formed by a method comprising operating the field emission device at a pressure of at most about 10^{-8} Torr for a selected period of time to evacuate outgassed materials before sealing the field emission device. As explained in the specification, operating the field emission device results in certain materials outgassing from the anode of the device. If these outgassed materials are allowed to remain in the field emission device, they can contaminate and reduce the efficiency of the cathode element. While operating the field emission device at a sufficiently reduced pressure, the outgassed materials can be evacuated from the device before they are allowed to contaminate the cathode element. Following removal of much of this material, the field emission device can then be sealed. The result is a device with increased life and greater current stability. As pointed out by the Applicant on page 8, lines 11-16, of the present application, in one embodiment of the present invention, the field emission device was operated without observable tip degradation after running for many hours, even at high pressures. In contrast, conventionally manufactured field emission devices running under standard conditions of about 10^{-5} Torr to about 10^{-6} Torr may show severe tip degradation after running for less than 100 hours.

Konuma seeks to clean the cathode element of a cathode ray tube and to enhance the level of a vacuum in a cathode ray tube through the use of a getter in the tube. Konuma heats the

getter material, and gas is emitted from the getter. A voltage is applied to the cathode and the cathode cone to cause electrons to be emitted. These electrons collide with the gases from the getter, the gases are ionized, and the ions bombard the cathode to clean that element. Following this sputtering of the cathode, the tube is sealed, and the gettering continues to enhance the level of vacuum in the sealed CRT. Konuma uses a reduced electrical potential, less than a normal operating potential, in emitting electrons from the cathode. Konuma maintains a low electrical potential between the cathode and all other parts of the CRT in order to minimize damage to the cathode during the sputtering process. Konuma is concerned with cleaning the cathode rather than operating a device so as to allow normal outgassing of materials from the anode to occur. In fact, Konuma does not address the issue of materials outgassed from the anode during normal operation of the CRT.

Itoh *et al.* discuss a method for removing potentially contaminating gases from a CRT. Itoh *et al.* utilize a process of introducing a reducing gas into the display device, holding the reducing gas in the display device for several minutes, then evacuating the display device to about 10^{-5} Torr. This process is repeated several times, after which the tube is sealed. As noted by the Examiner, Itoh *et al.* also mention activating the “electron emitting means” while subjecting the display device to baking. Itoh *et al.* describe such a process as an adjunct to the gas cleaning process which is central to Itoh *et al.* And Itoh *et al.* suggest a level of evacuation that is less than that disclosed and claimed by the present Applicant. Moreover, Itoh *et al.* also suggest that a process of simply activating the device while evacuating the tube “fail[s] to sufficiently discharge gas from the display device.” Itoh *et al.*, col. 2, ll.-39-42.

Contrary to the suggestion of Itoh *et al.*, the Applicant has described that utilizing the methods described in claims 1 and 9 to manufacture the device described in claims 15 and 21

results in longer life for the field emission device. Specification, p. 8, ll. 11-16. Hence, Applicant has shown a fallacy in the discussion in Itoh *et al.*

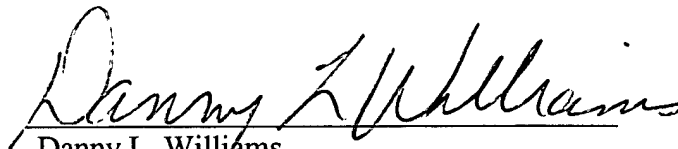
The Examiner relies on Watkins *et al.* for a teaching that a display device should be held in an atmosphere of 10^{-8} Torr for 1-2 hours prior to sealing in order to remove gas impurities. The Examiner asserts this teaching would be combined, by a person of ordinary skill, with Konuma or Itoh *et al.* to realize a method of operating the device at a pressure of 10^{-8} Torr or less for a selected period of time. However, as the Examiner has noted, and as mentioned above, Itoh *et al.* suggest that use of this process is not sufficient to satisfactorily evacuate contaminant materials from the tube. Hence, Itoh *et al.* teach away from the claimed method, and the person of ordinary skill in the art should not be expected to go against such suggestion. Moreover, the person of ordinary skill would not be led to combine Watkins *et al.* with Konuma to realize the presently claimed invention. As already pointed out, Konuma is concerned with cleaning the cathode element of a CRT. The "full pressure" within Konuma's CRT during this cleaning process varies between about 10^{-9} Torr and 10^{-5} Torr depending on the exact point in time. However, the exact pressure does not appear to be particularly significant. Rather, Konuma wishes to inject certain gases into the tube (via the getter), which gases can collide with electrons so as to obtain ions, which ions may then bombard the cathode so as to clean the cathode. Because Konuma's application differs from that of the present application, nothing suggests the combination of Watkins with Konuma to realize the inventions of the present claims. The Examiner has shown no reason or rationale for combining the cited references, nor has he shown that any such combining would yield the inventions set forth in the pending claims.

Applicant respectfully requests reconsideration by the Examiner of his rejections of claims 1-27. If the Examiner has any questions or comments, or if a telephone conference would

facilitate disposition of this case, he is encouraged to contact the undersigned by telephone at (713) 934-4060.

Respectfully submitted,

Date: November 20, 2001

A handwritten signature in cursive script, reading "Danny L. Williams", written over a horizontal line.

Danny L. Williams

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